

ARTICLE CARRIER HAVING SINGLE SIDED RELEASABLE CROSS BAR

FIELD OF THE INVENTION

[0001] This invention relates to vehicle article carriers, and more particularly to a vehicle article carrier incorporating a locking mechanism which allows a user to simultaneously place both bracket members of the article carrier in locked and unlocked positions by manually engaging a single actuating member at one side of the vehicle article carrier, and without interfering with the roof of the vehicle during manipulation of the actuating member.

BACKGROUND OF THE INVENTION

[0002] Vehicle article carriers are used in a wide variety of applications to transport a variety of articles above an outer body surface of the vehicle. Such vehicle article carriers typically include a pair of slats or elevated siderails which are fixedly mounted to the outer body surface of the vehicle, a pair of bracket members slidably disposed at ends of the slats or siderails, and a cross bar disposed between the bracket members so as to be supported above the outer body surface by the bracket members. In some applications two cross bars are employed, with the second cross bar being secured either fixedly to the slats or siderails, or being adjustably secured via its own pair of bracket members disposed slidably upon the slats or siderails.

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[0003] Each bracket member used in most vehicle article carrier systems typically includes some form of locking mechanism with an actuating member for placing the locking mechanism in a locked or unlocked position. When the locking mechanism of each bracket member is in its unlocked position, both bracket members may be moved slidably along the slats or siderails to allow the cross bar therebetween to be repositioned as desired along the slats. The obvious drawback to this arrangement is that when the user desires to reposition the cross bar, first one of the bracket members must be unlocked and then the user must walk around to the opposite side of the vehicle to unlock the other bracket member. Once the cross bar has been moved to its desired position by the user, the user must manually place both of the bracket members in their locked positions. Thus, the user is presented with the inconvenience of separately locking and unlocking two bracket members whenever the cross bar is to be repositioned.

[0004] Some manufacturers of vehicle article carriers have attempted to address this problem by providing means for simultaneously locking and unlocking each bracket member via a single actuating mechanism. One such article carrier is disclosed in U.S. Patent No. 5,190,198 to Cucheran, assigned to the assignee of the present application. Other forms of single-side releasable mechanisms are disclosed in U.S. 6,112,964 to Cucheran et al. The disclosures of each of these patents are hereby incorporated by reference into the present application.

09971838-100501

[0005] While the single-side releasable crossbars disclosed in the above-referenced patents have proven to be successful and satisfactory for their intended uses, in some applications where a siderail is employed, there is very little clearance between the underside of the bracket mechanism at each end of the cross bar and the outer body surface of the vehicle. This necessitates a form of actuating member which can be opened and closed without interference with the outer body surface of the vehicle roof.

[0006] Accordingly, it would be highly desirable to provide a vehicle article carrier which incorporates a means for simultaneously locking and unlocking both bracket members from their respective slats, as well as a means for holding both bracket members in their unlocked positions once the bracket members are urged into an unlocked orientation. It would be further be highly desirable to provide such a bracket member which includes an actuating member which can be moved pivotably between locked and unlocked positions by a user without interfering with the outer body surface of the vehicle.

SUMMARY OF THE INVENTION

[0007] The above and other objects are provided by a vehicle article carrier apparatus having a single-sided release mechanism in accordance with preferred embodiments of the present invention. The apparatus generally includes a pair of siderails which are adapted to be fixedly secured to an outer body surface of a vehicle. The siderails are secured in a spaced apart, generally parallel configuration on the outer body surface of the vehicle. At least one cross

09971838-100501

bar, and more preferably a pair of cross bars, are supported span-wise between the siderails. A bracket member is disposed at each end of at least one of the cross bars which allows the cross bar to be repositioned along the siderails as may be needed.

[0008] In one preferred embodiment each bracket member further includes a locking pin which is disposed for linear, sliding movement within a housing portion of the bracket member. The locking finger is adapted to engage within one of a plurality of predefined, spaced apart openings in the siderail to allow the bracket member to be supported at a desired position along the siderails. A biasing member continuously biases a locking pin toward engagement with one of the predefined openings in the siderail. The locking pin also includes at least one transversely extending post which forms a cam follower surface, and an elongated slot.

[0009] The housing further includes an actuating member which is supported pivotally relative to the housing so that it may be easily grasped by a user with one or more fingers and moved between locked and unlocked positions. The actuating member includes at least one camming surface adapted to engage with the post on the locking pin to urge the locking pin away from the siderail when the actuating member is moved into an unlocked position. Moving the actuating member into a locked position allows a biasing element associated with the locking pin to urge the locking pin toward and into engagement with the slat.

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[0010] It is a principal advantage of the bracket mechanism of the present invention that the actuating member requires very little clearance when moved between its locked and unlocked positions. This allows the cross bar to be supported closer to the outer body surface of the vehicle without interfering with use of the actuating member. Allowing the cross bar to be supported closer to the outer body surface provides a more aerodynamic article carrier assembly and can potentially reduce wind noise and aerodynamic drag which might otherwise be caused by the cross bar being positioned at a height significantly above the outer body surface.

[0011] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0013] Figure 1 is a perspective view of a portion for a vehicle showing a preferred embodiment of the present invention secured to the outer body surface;

09971838-100501

[0014] Figure 2 is an exploded perspective view of the bracket mechanism of the present invention and a portion of one cross bar to which the bracket mechanism is secured to support the cross bar from the siderail;

[0015] Figure 3 is a perspective view of the bracket member with a portion of the side rail shown in phantom.

[0016] Figure 4 is a perspective view of just the actuating member.

[0017] Figure 5 is a simplified, side cross sectional view taken in accordance with section line 5-5 in Figure 1 showing the actuating members at each end of the cross bar in their locked positions; and

[0018] Figure 6 is a view of the cross bar of Figure 5 showing one of the actuating member in an unlocked position, and wherein the locking pin at each end support is unlocked from its respective siderail.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] The following description of the preferred embodiment(s) is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

[0020] Referring to Figures 1 and 2, there is shown a vehicle article carrier 10 in accordance with a preferred embodiment of the present invention. The vehicle article carrier 10 includes a pair of siderails 12 (Figure 1) which are disposed generally parallel to one another and which are supported above an outer body surface 14 of a motor vehicle 16. Each siderail 12 is supported at its opposite ends by a pair of mounting feet 18 and each includes a channel 12a

(better visible in Figure 2) having a plurality of spaced apart openings 12b. The openings 12b are indicated in phantom in Figure 2. The mounting feet 18 are all securely affixed to the outer body surface 14 via conventional fasteners such as rivnuts.

[0021] The article carrier 10 further includes at least one cross bar 20 which may be adjustably positioned along the siderails 12. Preferably, a second adjustable cross bar 21 is also provided. Cross bar 21 is shown as being identical to cross bar 20, but it will be appreciated that a fixed cross bar could be substituted ^{for} ~~in place of~~ adjustable cross bar 21. Since cross bars 20 and 21 are identical, reference only to cross bar 20 will be made when describing the construction and components of each of the cross bars 20 and 21.

[0022] The cross bar 20 includes an end support 22 at each end thereof which supports a cross bar member 24 therebetween above the outer body surface 14. Each of the end supports 22 further include a user engageable actuating member 26. The actuating member 26 allows both end supports 22 to be simultaneously locked or unlocked from the siderails 12 by unlocking only one of the actuating members 26. This operation will be described in greater detail in the following paragraphs.

[0023] Referring to Figures 2 and 3, one of the end supports 22 is shown in greater detail. End support 22 includes a housing 22a having a base portion 22b integrally formed therewith. Base portion 22b includes a pair of bores 28 each adapted to receive a shaft 32 of a guide wheel 30 therein. The guide wheels 30 help to guide the base portion 22b within the channel 12a of its

associated siderail 12 such that the entire housing 22a can be moved slidably along the siderail when the actuating member 26 is in its unlocked position.

[0024] The housing 22a further includes a channel or trough 34 which is in communication with an opening 36 (Figure 3) in the base portion 22b. An open area 38 separates the channel 34 from the base portion 22b. A distal end 24a of cross bar member 24 is received within an opening 40 (Figure 2) of the housing 22a and is secured therein preferably via one or more threaded fasteners (not shown) in conventional fashion.

[0025] With further reference to Figure 2, the locking pin 42 includes a generally cylindrical body 44 having an elongated slot 46 and a pair of oppositely extending post portions 48. A shoulder 50 abuts one end of a spring 52 when the end support 22 is assembled such that the end support can be biased continuously towards its associated siderail 12. A tapered nose 54 of the locking pin 42 further eases insertion of the locking pin into one of the openings 12b in the siderail 12.

[0026] Referring further to Figures 2 and 4, the actuating member 26 will now be described. The actuating member 26 is retained to the housing via a pivot pin which includes a manually graspable end portion 56 and a main body portion 58. The main body portion 58 includes a bore 60 through which a pivot pin 62 is inserted. The pivot pin 62 further extends through an opening 22c (Figure 2) in the housing 22a, and the slot 46 in the locking pin 42 when the end support 22 is fully assembled. With specific reference to Figure 4, the main body

portion 58 includes a pair of spaced apart camming surfaces 64 which each have a detent recess 66.

[0027] Referring now to Figures 4 and 5, the actuating member 26 can also be seen to include an attachment portion 68 which forms a pocket within which an enlarged end 70 of a cable 72 can be trapped. From Figure 5 it can be seen that cable 72 is also coupled to the locking pin 42 of the opposite end support 22. The cable 72 extends within the channel 24b of the cross bar member 24 and is concealed underneath a support strip 73 which is placed over the channel portion 24b of the cross bar member 24 during final assembly of the cross bar 20. The opposite actuating member 26 similarly includes a cable 76 coupled to the locking pin 42 of the leftmost actuating member 26 in the drawing of Figure 5. Cable 76 is likewise disposed in within channel 24 when the cross bar 20 is fully assembled. Cable 76 is secured to cable 72 by a spring 74 which helps to maintain tension in each of the cables.

[0028] During operation, when the actuating members 26 are both in their locked positions (Figure 5), the spring 52 associated with each end support 22 biases its associated locking pin 42 into engagement with one of the openings 12b in an associated one of the siderails 12. When the cross bar 20 is to be adjustably positioned on the siderails 12, the user grasps the end portion 56 of one or the other of the actuating members 26 and lifts upwardly to urge the member 26 into the position shown in Figure 6. The post portions 48 of the locking pin 42 associated with the actuating member 26 being unlocked rides over the camming surfaces 64 until seating within the detent recesses 66. When

this position is reached, the user may release the actuating member 26 and the member will remain in the unlocked position shown in Figure 6. As the member 26 is urged into this position, it pivots about pivot pin 62. The elongated slot 46 allows the locking pin 42 to move linearly into engagement with one of the openings 12b in the siderail 12.

[0029] It is a principal advantage of the present invention that the pivoting movement of the actuating member 26 is accomplished without an outer surface 80 of the actuating member 26 being forced to protrude significantly outwardly of the housing 22a of the end support 22. Thus, the end support 22 can be used to support a cross bar closely adjacent an outer surface of a vehicle without experiencing interference with the outer surface as the actuating member 26 is moved between its locked and unlocked positions. Thus, an even lower profile, more aerodynamic article carrier can be constructed because of the ability of the actuating member 26 to be opened and closed without requiring significant clearance between it and an outer body surface of the vehicle.

[0030] With specific reference to Figure 6, the leftmost actuating member 26 is shown in its fully unlocked position. The post portions 48 of the locking pin 46 have been urged out of engagement with their respective openings 12b, thus causing the locking pins 42 to be retracted from their openings 12b. This has also caused the cable 72 to be placed under greater tension, which in turn urges the locking pin 42 of the rightmost end support 22 out of engagement with opening 12b of its associated siderail 12. Thus, the unlocking of each of the locking pins 42 is accomplished simultaneously with a single movement of one or

the other of the actuating members 26. This unlocking action can be effected in the same manner if the right most actuating lever 26 in the drawing of Figure 6 is lifted instead. Urging the left most actuating member 26 back into its locked position (Figure 5) simultaneously causes both locking pins 42 to be urged back into engagement with the openings 12b in their associated siderails 12.

[0031] The cross bar of the present invention thus provides a pair of end supports 22 each having a construction which allows both end supports to be simultaneously locked or unlocked from their respective siderails 12, and importantly without requiring significant clearance between the end supports 22 and the outer body surface of a the vehicle.

[0032] Those skilled in the art can now appreciate from the foregoing description that the broad teachings of the present invention can be implemented in a variety of forms. Therefore, while this invention has been described in connection with particular examples thereof, the true scope of the invention should not be so limited since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specification and following claims.

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